using condoms'' (6.5%). Alcohol and illicit drug use was cited only by one man and a desire to become pregnant by only one woman as a reason for not using condoms.

In all, 86% of sexually active participants (n = 100) had disclosed their HIV status to their partner (table 2). Knowledge of partner's HIV status was the only variable significantly associated with the participant disclosing their HIV status to their partner ($p<0.001$). Of the 86 participants who had disclosed their HIV status, 48 thought that their partner had HIV (47 known to have had HIV test), 25 thought their partner did not have HIV (23 known to have had HIV test), and 13 did not know their partner's HIV status (three known to have had HIV test). In those who had disclosed their HIV status, only knowledge of their partner's HIV status was significantly associated with condom use ($p = 0.03$). Participants were most likely to use condoms if they thought their partner did not have HIV (91.7% of 24 participants) or thought their partner had HIV (74.5% of 47 participants). Condoms were used by only 53.6% of 13 participants who did not know their partner's HIV status.

## DISCUSSION

This study provides information on the sexual behaviour of HIV positive heterosexual adults accessing HIV care in a large UK outpatient clinic. The majority of participants were sexually active. Of these, most met their most recent partner in the United Kingdom and used condoms when they last had sex. However, over a quarter of the participants did not use condoms when they last had sex and this was significantly more common in those with lower CD4 counts although the reason for this is unclear. By contrast with studies from America[4 5] and Europe,[6] where drug use is an important factor for higher risk behaviour, in this study alcohol and drugs influenced the decision not to use a condom in only one man. The most common reason for not using condoms—namely, partner or patient objection, has been noted before.[7] Although most participants were of childbearing age, only one cited wanting to become pregnant as a reason for not using condoms.

Disclosure is an issue for a significant proportion of participants since; 14% had not informed their partners of their HIV status and 26% were unaware of whether their partner had had an HIV test or what their partner's status was. Disclosure of participant's HIV status and condom use was significantly associated with knowing their partner's HIV status. Overcoming the barriers to disclosure remains a formidable challenge for both secondary HIV prevention and early detection of HIV infected individuals.

This study has several limitations. The response rate was low and those who did not respond may have different sexual behaviour from those who responded. However, the responders differed significantly on only two demographic and HIV related variables from the non-responders and are therefore likely to be representative of the heterosexual clinic attendees. The study took place in a single inner city HIV clinic and further research needs to be conducted in different settings. We relied on self reported sexual practices but there is good evidence that self reported data from sexual behaviour studies of HIV infected people are reliable.[8]

In summary, our study findings highlight the importance of discussing sexual behaviour with HIV infected patients to reduce secondary transmission and the need to strengthen efforts to facilitate disclosure of HIV status.

## ACKNOWLEDGEMENTS

The authors would like to thank the study participants and clinic staff for their support in conducting the study and Dr Catherine Mercer and Dr Rob F Miller for their valuable contributions to the manuscript.

## CONTRIBUTORS

EJ and SSD conceived the study; additional help with study design was provided by JS and DEM; SSD, EJ, and NP distributed the questionnaires; SSD entered and analysed the data and, with EJ, wrote the first and last drafts; JS and DEM provided critical appraisal of the manuscripts.

## Authors' affiliations

**S S Dave, N Panahmand, E Jungmann,** Mortimer Market Centre, Camden Primary Care Trust, London WC1E 6AU, UK
**J Stephenson, D E Mercey,** Centre for Sexual Health and HIV Research, Department of Primary Care and Population Sciences, Royal Free and University College Medical School, University College London, Mortimer Market Centre, off Capper Street, London WC1E 6AU, UK

Funding: none.

Conflict of interest: none.

Ethical approval: Camden and Islington Community Health Services Local Research Ethics Committee.

Correspondence to: Dr Eva Jungmann, GUM/HIV, Mortimer Market Centre, off Capper Street, London WC1E 6AU, UK; eva.jungmann@camdenpct.nhs.uk

Accepted for publication 27 September 2005

## REFERENCES

1 **Health Protection Agency**. *Reviewing the focus, HIV and other sexually transmitted infections in the United Kingdom in 2002*. An update: November, 2003.
2 **Communicable Disease Surveillance Centre**. Survey of Prevalent Diagnosed HIV Infections, Tables 2002.
3 **Department of Health**. *National strategy for sexual health and HIV*. London: DoH, 2001.
4 **De Hovitz JA**, Feldman J, Brown LS, *et al*. Sexual risk behaviour among subgroups of heterosexual HIV infected patients in an urban setting. *Genitourin Med* 1997;**73**:552–4.
5 **Wilson TE**, Massad LS, Riester KA, *et al*. Sexual, contraceptive, and drug use behaviors of women with HIV and those at high risk for infection : results from the Women's Interagency HIV Study. *AIDS* 1999;**13**:591–8.
6 **Van Bentham BH**, Prins M, Larsen C, *et al*. Sexually transmitted infections in European HIV-infected women: incidence in relation to time from infection. *AIDS* 2000;**14**:595–603.
7 **Clark RA**, Kissinger P, Bedimo AL, *et al*. Determination of factors associated with condom use among women infected with human immunodeficiency virus. *Int J STD AIDS* 1997;**8**:229–38.
8 **De Boer MA**, Celentano DD, Tovanabutra S, *et al*. Reliability of self-reported sexual behavior in human immunodeficiency virus (HIV) concordant and discordant heterosexual couples in northern Thailand. *Am J Epidemiol* 1998;**147**:1153–61.

## COMMENTARY

Although HIV transmission is as much a result of infectiousness as of susceptibility, to date, most HIV prevention strategies have focused on reducing risk among uninfected individuals, even though recommendations have been made to target behaviour change among those who are HIV infected.[1 2] Recently, additional studies have provided further support for targeting prevention among infected individuals by demonstrating the potential for decreasing infectiousness by reducing viral load through treatment for HIV and other STIs.[2–5]

Perhaps one reason why such recommendations have not been widely implemented is that few studies have provided empirical data describing risk behaviours in which HIV infected individuals engage. Here, Dave *et al* examined condom use and HIV disclosure among HIV infected individuals who presented at a large STD clinic in inner London. Weaknesses of the study (such as the low response rate and the cross sectional nature of the study) notwithstanding, there are several findings worth highlighting that

add more evidence to the importance of focusing prevention strategies on HIV infected individuals. For example, the most significant factor associated with condom use at last sex was having a CD4 count of more that 200. Although this may bode well given higher infectivity associated with earlier stages of infection, it is worrying given evidence of similarly higher infectivity rates during late stage of the disease.[7 8]

Disclosure of infection status, allowing both members of a couple to make an informed choice about engaging in safe sex, is also a critical component of any kind of prevention programme. In this study, knowledge of partner's HIV status was the only factor associated with disclosure on the part of the participant. Furthermore, among those who disclosed their HIV status, knowledge of their partner's HIV status was the only factor associated with condom use at last sex. Although data were not presented regarding the association between knowing your partner's serostatus on condom use among those participants who did *not* disclose their status themselves, nevertheless, the links among disclosure, knowledge of the partner's status, and condom use are revealing. Strategies that encourage mutual disclosure, and that emphasise that disclosure is likely to be reciprocated, should be developed and evaluated.

Of course, another critical issue is whether any of the associations reported here might be mediated if one or both partners were on treatment, which could also contribute to the potential for transmission of HIV resistant virus. Regardless, the findings presented here by Dave *et al*[6] further confirm the importance of targeting prevention strategies towards infected individuals. Programmes like this, which occur in the context of clinics that provide care for infected individuals, are an obvious venue for targeting prevention towards infected individuals. Additional research is necessary to devise population based strategies for identifying and including them in effective prevention programmes.

**Nancy S Padian**
University of California, San Francisco, Global Health Sciences, Women's Global Health Imperative, 50 Beale Street, Suite #1200, San Francisco, CA 94105, USA; npadian@globalhealth.ucsf.edu

## REFERENCES

1 **Centers for Disease Control and Prevention**. Demonstration Projects for Community-Based Organizations (CBOs). Prevention Case Management (PCM) for Persons Living with HIV/AIDS, Centers for Disease Control and Prevention, Department of Health and Human Services, October 2004, www.cdc.gov/hiv/prev_prog/ahp/resources/factsheets/PCM.htm, information accessed 18 January, 2006.
2 **Baeten JM**, Overbaugh J. Measuring the infectiousness of persons with HIV-1: opportunities for preventing sexual HIV-1 transmission. *Curr HIV Res* 2003;**1**:69–86.
3 **Sheth PM**, Danesh A, Sheung A, *et al*. Disproportionately high semen shedding of HIV is associated with compartmentalized cytomegalovirus reactivation. *J Infect Dis* 2006;**193**:45–8.
4 **Celum CL**, Robinson NJ, Cohen MS. Potential effect of HIV type 1 antiretroviral and herpes simplex virus type 2 antiviral therapy on transmission and acquisition of HIV type 1 infection. *J Infect Dis* 2005;**191**(Suppl 1):S107–14.
5 **Taylor S**, Boffito M, Vernazza PL. Antiretroviral therapy to reduce the sexual transmission of HIV. *J HIV Ther* 2003;**8**:55–66.
6 **Dave SS**, Stephenson J, Mercey DE, *et al*. Sexual behaviour, condom use, and disclosure of HIV status in HIV infected heterosexual individuals attending an inner London HIV clinic. *Sex Transm Infect* 2006;**82**:117–9.
7 **Rapatski BL**, Suppe F, Yorke JA. HIV epidemics driven by late disease stage transmission. *J AIDS* 2005;**38**:241–53.
8 **Leynaert B**, Downs AM. Heterosexual transmission of human immunodeficiency virus: variability of infectivity throughout the course of infection. European Study Group on Heterosexual Transmission of HIV. *Am J Epidemiol* 1998;**148**:88–96.